

"The Original Online ST Magazine"

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Our support BBS carries ALL issues of STReport
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- The Editors' Podium
- Kidpublisher Professional
- SEAGATE * Industry Standard *
- Migraph's HAND SCANNER
- CPU REPORT LHARC/ARC
- SYQUEST * NEW PRODUCTS *
- Exploring Touchup
- ST REPORT CONFIDENTIAL
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-----*** BILL TEAL SHOWS PC DITTO II! ***-----
--==** GRAVIS TO CORRECT MEGA ST BUG! **==--

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> The Editor's Podiumâ ¢

We are in the home stretch now, 25 days left till Christmas... will there be a Stacy under someone's tree? Who knows? We do know that the Stacy will be reality very shortly and that to us is all that counts. No

more is it if...its now a matter of when.

Amazing times we are in, LHARC has a few folks befuddled, consider this, if we don't use it and not allow it to gain in popularity, it will never be enhanced to a point where most of us will be satisfied with its performance. Even more amazing are those who attempt to rationalize their apparent dissatisfaction with LZH files by attempting to have the online sysops reverse their positions. It is indeed gratifying to see the majority of users want the benefits LZH files will offer.

In maintaining the standard of having the best interests of our readers come first, STReport will be uploaded to the major services in two forms, LHARC & ARC. Even though it appears the users prefer LHARC (LZH), we felt it best to allow the reader an opportunity to compare the two compression programs and the efficiency each program has to offer. Accordingly, for the next three weeks, STReport will be uploaded in both formats for your convenience.

Our humble opinion is really quite uncomplicated, anytime a compression program makes a SMALLER downloadable file, then that's the one we want as it takes less time to download a smaller file. Thus, it translates into the users saving online time and dollars.

Everyone of us enjoys what they do for us, we give them heartburn and grief, and best of all, we expect them to be there all the time. No, I am not talking about anyone's parents or relatives. The ever faithful and serving SysOps of the online services deserve our heartfelt thanks everyday of the year but that would get old in hurry. So... since it is 'that' time of the year, let's all join together and offer out thank you to the sysops of the online services. Since there are a large number of good folks doing this monumental task, we ask that Ron Luks, Darlah Pine and Clayton Walnum pass along our best wishes to all the folks working with them to make our online lives a little bit nicer every day.

Please enjoy the holiday season and above all else, make this holiday season a fun filled, safe yuletide celebration. Don't drink and drive.

Ralph.....

"ATARI IS BACK!"

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:HOW TO GET YOUR OWN GENIE ACCOUNT:

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To sign up for GENie service: Call: (with modem) 800-638-8369.

Upon connection type HHH (RETURN after that).

Wait for the U#= prompt.

Type XJM11877,GENie and hit RETURN.

The system will prompt you for your information.

## THE GENIE ATARI ST ROUNDTABLE - AN OVERVIEW

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The Roundtable is an area of GENie specifically set aside for owners and users of Atari ST computers, although all are welcome to participate.

There are three main sections to the Roundtable: the Bulletin Board, the Software Library and the Real Time Conference area.

The Bulletin Board contains messages from Roundtable members on a variety of Topics, organized under several Categories. These messages are all Open and available for all to read (GENie Mail should be used for private messages).

If you have a question, comment, hot rumor or an answer to someone else's question, the Bulletin Board is the place to share it.

The Software Library is where we keep the Public Domain software files that are available to all Roundtable members. You can 'download' any of these files to your own computer system by using a Terminal Program which uses the 'XMODEM' file-transfer method. You can also share your favorite Public Domain programs and files with other Roundtable members by 'uploading' them to the Software Library. Uploading on GENie is FREE, so you are encouraged to participate and help your Roundtable grow.

The Real Time Conference is an area where two or more Roundtable members may get together and 'talk' in 'real-time'. You can participate in organized conferences with special guests, drop in on our weekly Open Conference, or simply join in on an impromptu chat session. Unlike posting messages or Mail for other members to read at some later time, everyone in the Conference area can see what you type immediately, and can respond to you right away, in an 'electronic conversation'.

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> CPU REPORTâ € Exploring the compression routines.....  
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Issue # 43  
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by Michael Arthur

Remember When....

In January 1979, two MIT Graduates, Dan Bricklin and Bob Frankston, introduced Visicalc, the first electronic spreadsheet, and how Software Arts (their company) sold 800,000 copies of it before being bought in 1985 by Lotus Corporation, who discontinued Visicalc?

Data Compression Algorithms of ARC.TTP, PKZIP, and LHarc

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Much of the typical modem user's online time is spent performing uploads or downloads of files from BBS's, Online Services like Compuserve or GENie, or Information Networks like Usenet or Internet. Given that this always takes up a lot of time, and usually costs a considerable amount of money, the need to shorten the time necessary to perform file transfers, and other modem applications has always been prevalent. One innovation in this field has been the development of advanced Algorithms for compacting, or compressing data so it takes up much less space, and packing multiple files into one Archive, or data file, so many files can be sent at one time.

The current technology, an offspring of data encryption methods used in World War II, reduces the time it takes to transfer a file through a modem, by reducing the size of the data itself. Given the proliferation of many data compression methods (ARC, PKZIP, ZOO, SIT, and LHARC, for a few examples) that try to provide the most efficient method of data compression, the topic has always been controversial in nature.

Haruhiko Okumura provided a great source of knowledge about data compression algorithms by writing this essay, which describes some of the effort involved in creating a data compression standard. Except for modifications in its formatting, or presentation, and various notes placed in this text to provide more information on certain subjects, the content of Haruhiko Okumura's text is identical....

Introduction: History of LHARC's Forefathers

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In the spring of 1988, I wrote a very simple data compression program named LZSS in C language, and uploaded it to the Science SIG (forum) of PC-VAN, Japan's biggest personal computer network. That program was based on Storer and Szymanski's slightly modified version of one of Lempel and Ziv's algorithms. Despite its simplicity, for most files its compression outperformed the archivers then widely used.

Kazuhiko Miki rewrote my LZSS in Turbo Pascal and assembly language, and soon made it evolve into a complete archiver, which he named LARC. The first versions of LZSS and LARC were rather slow. So I rewrote my LZSS using a binary tree, and so did Miki. Although LARC's encoding was slower than the fastest archiver available, its decoding was quite fast, and its algorithm was so simple that even self-extracting files (compressed files plus decoder) it created were usually smaller than non-self-extracting files from other archivers.

Soon many hobby programmers joined the archiver project at the forum. Very many suggestions were made, and LARC was revised again and again. By the summer of 1988, LARC's speed and compression have improved so much that LARC-compressed programs were beginning to be uploaded in many forums of PC-VAN and other networks.

In that summer I wrote another program, LZARI, which combined the LZSS algorithm with adaptive arithmetic compression. Although it was slower

than LZSS, its compression performance was amazing. Miki, the author of LARC, uploaded LZARI to NIFTY-Serve, another big information network in Japan. In NIFTY-Serve, Haruyasu Yoshizaki replaced LZARI's adaptive arithmetic coding with a version of adaptive Huffman coding to increase speed. Based on this algorithm, which he called LZHUF, he developed yet another archiver, LHarc.

## Data Compression Algorithms, Lempel-Ziv, and ARC.TTP

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In what follows, I will review several of these algorithms and supply simplified codes in C language.

### 1. RLL Encoding

Replacing several (usually 8 or 4) "space" characters by one "tab" character is a very primitive method for data compression. Another simple method is Run-Length coding, which encodes the message "AAABBBBAACCCC" into "3A4B2A4C", for example.

### 2. LZSS coding

This scheme is initiated by Ziv and Lempel [1]. A slightly modified version is described by Storer and Szymanski [2]. An implementation using a binary tree is proposed by Bell [3]. The algorithm is quite simple: Keep a ring buffer, which initially contains "space" characters only. Read several letters from the file to the buffer. Then search the buffer for the longest string that matches the letters just read, and send its length and position in the buffer.

If the buffer size is 4096 bytes, the position can be encoded in 12 bits. If we represent the match length in four bits, the <position, length> pair is two bytes long. If the longest match is no more than two characters, then we send just one character without encoding, and restart the process with the next letter. We must send one extra bit each time to tell the decoder whether we are sending a <position, length> pair or an unencoded character.

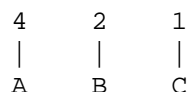
### 3. LZW coding

This scheme was devised by Ziv and Lempel [4], and modified by Welch [5]. The LZW coding has been adopted by most of the existing archivers, such as ARC and PKZIP. The algorithm can be made relatively fast, and is suitable for hardware implementation as well. A Pascal program for this algorithm is given in Storer's book [6].

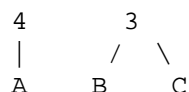
The algorithm can be outlined as follows: Prepare a table that can contain several thousand items. Initially register in its 0th through 255th positions the usual 256 characters. Read several letters from the file to be encoded, and search the table for the longest match. Suppose the longest match is given by the string "ABC". Send the position of "ABC" in the table. Read the next character from the file. If it is "D", then register a new string "ABCD" in the table, and restart the process with the letter "D". If the table becomes full, discard the oldest item or, preferably, the least used.

#### 4. Huffman coding

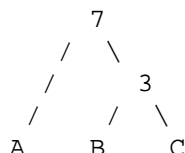
Classical Huffman coding is invented by Huffman [7]. A fairly readable account is given in Sedgewick [8]. Suppose the text to be encoded is "ABABACA", with four A's, two B's, and a C. We represent this situation as follows:



Combine the least frequent two characters into one, resulting in the new frequency  $2 + 1 = 3$ :



Repeat the above step until the whole characters combine into a tree:



Start at the top ("root") of this encoding tree, and travel to the character you want to encode. If you go left, send a "0"; otherwise send a "1". Thus, "A" is encoded by "0", "B" by "10", "C" by "11". Altogether, "ABABACA" will be encoded into ten bits, "0100100110". To decode this code, the decoder must know the encoding tree, which must be sent separately.

A modification to this classical Huffman coding is the adaptive, or dynamic, Huffman coding. See, e.g., Gallager [9]. In this method, the encoder and the decoder processes the first letter of the text as if the frequency of each character in the file were one, say. After the first letter has been processed, both parties increment the frequency of that character by one. For example, if the first letter is 'C', then freq ['C'] becomes two, whereas every other frequencies are still one. Then the both parties modify the encoding tree accordingly. Then the second letter will be encoded and decoded, and so on.

#### 5. Arithmetic coding

The original concept of arithmetic coding is proposed by P. Elias. An implementation in C language is described by Witten and others [10].

Although the Huffman coding is optimal if each character must be encoded into a fixed (integer) number of bits, arithmetic coding wins if no such restriction is made.

As an example we shall encode "AABA" using arithmetic coding. For simplicity suppose we know beforehand that the probabilities for "A" and "B" to appear in the text are  $3/4$  and  $1/4$ , respectively.

Initially, consider an interval:

$$0 \leq x < 1.$$

Since the first character is "A" whose probability is 3/4, we shrink the interval to the lower 3/4:

$$0 \leq x < 3/4.$$

The next character is "A" again, so we take the lower 3/4:

$$0 \leq x < 9/16.$$

Next comes "B" whose probability is 1/4, so we take the upper 1/4:

$$27/64 \leq x < 9/16,$$

Because "B" is the second element in our alphabet, {A, B}. The last character is "A" and the interval is

$$27/64 \leq x < 135/256,$$

which can be written in binary notation

$$0.011011 \leq x < 0.10000111.$$

Choose from this interval any number that can be represented in fewest bits, say 0.1, and send the bits to the right of "0."; in this case we send only one bit, "1". Thus we have encoded four letters into one bit! With the Huffman coding, four letters could not be encoded into less than four bits.

To decode the code "1", we just reverse the process: First, we supply the "0." to the right of the received code "1", resulting in "0.1" in binary notation, or 1/2. Since this number is in the first 3/4 of the initial interval  $0 \leq x < 1$ , the first character must be "A". Shrink the interval into the lower 3/4. In this new interval, the number 1/2 lies in the lower 3/4 part, so the second character is again "A", and so on. The number of letters in the original file must be sent separately (or a special 'EOF' character must be appended at the end of the file).

The algorithm described above requires that both the sender and receiver know the probability distribution for the characters. The adaptive version of the algorithm removes this restriction by first supposing uniform or any agreed-upon distribution of characters that approximates the true distribution, and then updating the distribution after each character is sent and received.

## 6. LZARI

In each step the LZSS algorithm sends either a character or a <position, length> pair. Among these, perhaps character "e" appears more frequently than "x", and a <position, length> pair of length 3 might be commoner than one of length 18, say. Thus, if we encode the more frequent in fewer bits and the less frequent in more bits, the total length of the encoded text will be diminished. This consideration suggests that we use Huffman or arithmetic coding, preferably of an adaptive kind, along with LZSS. This is easier said than done, because there are many possible <position, length> combinations. Adaptive compression must keep running statistics of frequency distribution. Too many items make statistics

unreliable.

## LZARI, and the Creation of a Data Compression Program

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What follows is not even an approximate solution to the problem posed above, but anyway this was what I did in the summer of 1988.

I extended the character set from 256 to three-hundred or so in size, and let characters 0 through 255 be the usual 8-bit characters, whereas characters 253 + n represent that what follows is a position of string of length n, where n = 3, 4, .... These extended set of characters will be encoded with adaptive arithmetic compression.

I also observed that longest-match strings tend to be the ones that were read relatively recently. Therefore, recent positions should be encoded into fewer bits. Since 4096 positions are too many to encode adaptively, I fixed the probability distribution of the positions "by hand". The distribution function given in the accompanying LZARI.C is rather tentative; it is not based on thorough experimentation. In retrospect, I could encode adaptively the most significant 6 bits, say, or perhaps by some more ingenious method adapt the parameters of the distribution function to the running statistics.

At any rate, the present version of LZARI treats the positions rather separately, so that the overall compression is by no means optimal. Furthermore, the string length threshold above which strings are coded into <position, length> pairs is fixed, but logically its value must change according to the length of the <position, length> pair we would get.

## 7. LZHUF

LZHUF, the algorithm of Haruyasu Yoshizaki's archiver LHarc, replaces LZARI's adaptive arithmetic coding with adaptive Huffman. LZHUF encodes the most significant 6 bits of the position in its 4096-byte buffer by table lookup. More recent, and hence more probable, positions are coded in less bits. On the other hand, the remaining 6 bits are sent verbatim.

Because Huffman coding encodes each letter into a fixed number of bits, table lookup can be easily implemented. Though theoretically Huffman cannot exceed arithmetic compression, the difference is very slight, and LZHUF is fairly fast.

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- [7] D. A. Huffman, Proc IRE 40, 1098-1101 (1952).
- [8] R. Sedgewick, Algorithms, 2nd ed. (Addison-Wesley, 1988).
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30, 520-540 (1987).

But ponder, if you will, these questions:

- 1) Are LHarc's benefits (comparative to ARC) best realized with large files, and if so, should this be the only use for LHarc, given that ARC is already a solid and usable standard for the ST?
- 2) Given that 8-voice stereo sound were the capabilities of the Amy sound chip, which Atari had been developing since 1984, is the sound chip in the Atari STE and 68030 TT (which has these capabilities) the Amy chip, which was a piece of Atari vaporware even older than the CD-ROM for the ST?

CPU Systems Roundup & XVI  
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#### MicroChannel, OS/2 1.2, and New Features of Old Offerings -----

IBM has recently revealed several features of its MicroChannel Bus Architecture (used in its PS/2 line of computers) which, though inherent, provide new potential for the success of the MicroChannel, and the defeat of the EISA Bus Architecture now being supported by several major IBM Clone Makers, including Compaq and HP. These features include:

- New 32-bit data streaming procedures, which would allow the MicroChannel to transfer data at 40 Megabytes per second, instead of the current 20 Megs per second, by sending blocks of data quicker than before using its independent address and data buses.
- A 64-bit data transfer mode, which uses a 64-bit wide address and data bus, along with multiplexing (for sending data across the extra bus area when it is idle), to allow 64 bit data transfer. This would double the data transfer rate to 80 Megabytes per second.
- Also, future extensions to the MicroChannel will double the rate at which blocks are sent through the bus (by reducing the "pause time" between block transmissions from the current 200 nanoseconds, and the 100 nanosecond time allowed by the new 32-bit data transfer procedures, to only 50 nanoseconds). This will allow the MicroChannel to move data along its bus at over 160 Megabytes per second....

While that may sound excessive, given that LAN Networks using the new FDDI standard (for connecting LANs using Optical Fiber lines) will have data transfer rates of 100 Megabytes per second, that Intel 80860 chip can compute 120 operations per second, and that future microchips made out of gallium arsenide will be able to run at 150 MHZ....

- Data Address Parity Checking, which will provide a form of error protection by ensuring that data which is sent through the MicroChannel is not corrupted or damaged. This feature was described in more depth by IBM, who had simply mentioned it previously.

- Synchronous Data Checking, which will enable the MicroChannel to isolate and shut down devices which are malfunctioning or not working properly.

- Synchronous Control Block Architecture, which lets the MicroChannel manage the devices hooked up to it like a Local Area Network handles nodes hooked up to it, with multimaster (or busmastering) cards controlling the system....

IBM also announced that OS/2 Standard Edition Version 1.2, a new version of OS/2, would be shipping soon. Some of its new features are:

- Faster system performance, and the ability to run comfortably in 2 Megs of RAM. OS/2 currently needs 3-4 Megs of RAM to be fully functional....

- Fast File System, for greatly increased disk performance, and support for larger hard disk volumes. This will be especially important for Virtual Memory under OS/2, which depends heavily on disk accessing....

- An Icon Area for Presentation Manager to store Custom Icons representing OS/2 Applications. This resembles the NextStep GUI's Dock, where applications can be placed for easy access.

- Hypertext-based Help system, for providing comprehensive help on the user interface at a 'click or a keystroke, and an Online Command sequence for information on all commands, and proper command syntax. This resembles NextStep's Digital Librarian, with its ability to search for data using keywords. Digital Librarian can also be used by NextStep applications, for powerful database versatility. Since Microsoft MAY decide to do the same with OS/2's new hypertext system....

IBM also announced that developer kits for OS/2 Standard Edition Version 2.0 will be available by Spring 1990. OS/2 Version 2.0 will utilize the 80386 and 80486 to let OS/2 multitask multiple DOS and OS/2 programs at the same time, provide 32-bit addressing for OS/2 programs, and be optimized for the 80386, for even greater system speed. Given the new capabilities of MicroChannel, IBM's Hardware Architecture for the Nineties, and OS/2, IBM's operating System for the 1990s, does IBM now have a better chance to increase its dominance of the microcomputer and workstation market in the coming decade?

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London, England

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Comcen has recently launched two CD-ROM disks for the IBM and Macintosh. C Add-Pack, the first CD-ROM, is a disk with over 1000 examples of C source code, for a broad range of programming needs. The second disk, the Graphics Add-Pack, comes with over 2000 items of "clip art" in GIF or MacPaint format, for use in Desktop Publishing. Cost: \$1000.00 each....

Morristown, NJ

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AT&T has made an agreement with Sun Microsystems to use Sun's SPARC-based workstations as front ends for graphics supercomputing applications (like medical imaging, simulations, etc.), and as aids in monitoring their phone networks.

In this agreement, they also intend to work together in a Partnership, in order to gain contracts for government systems, telecommunications services, and other major computer-related endeavors. Interestingly enough, one of the reasons that several major Unix vendors formed the Open Software Foundation (OSF) last year was AT&T/Sun's growing relationship....

Las Vegas, NV

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Xerox recently announced Ventura Publisher for OS/2, a new version which both uses the Presentation Manager user interface, and supports OS/2's IPC facilities for exchanging data between OS/2 apps. It will require 3 Megs of RAM to run. Cost: \$1000.00....

However, while it will be available by the Summer of 1990, along with a Professional Extension for specific Desktop Publishing needs, Aldus Pagemaker, its main competition in the DOS world, is already out for OS/2.

Tokyo, Japan

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Hitachi is in the process of developing a test production line for its experimental 16-Megabit DRAM memory chips, to be completed by Spring 1990. This comes only a few months after Hitachi (as well as many other companies) started making 4 Megabit DRAM chips in quantity. While 16-Megabit DRAM chips may have great potential, since some companies have already shown plans for 64-Megabit DRAM chips....

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Migraph Hand Scanner and Touch-Up  
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by Daniel Stidham

For me, like many of you, money is a hard-earned return on a crucial investment of time and effort. I've never won the lottery, nor have I ever been on the receiving end of a generous inheritance. My wife's maiden name has none of those familiar capitalistic overtones like Rockefeller, DuPont, Procter, or Gamble. No, except for the time I won the office pool for having three-of-a-kind on my check's serial number, I've never experienced any of that good old fashioned American easy money. Not that I'm complaining(well, maybe a little); if I didn't have to work for it, it probably wouldn't have the same sentimental value.

Therefore when I purchase a product I try to make my buck go as far and work as hard as I can; that new gadget may represent a week or two worth of hard, hassle-filled labor. Accordingly when that product fails me I become understandably upset and feel victimized as I watch several hours, days, or weeks worth of my time and labor get sucked into that black hole of broken promises and worthlessness. Conversely, I am appreciative and loyal to those companies and developers who, in respect of the consumer and of themselves, try to cultivate a wholesome, healthy, and equitable relationship by delivering excellent product for a fair and reasonable price. They have taken me seriously and I'll do the same.

In the ST community we are fortunate to have a relatively large percentage of companies and developers of the latter identity. There are a handful, however, that shine a little brighter than the rest and of those, one in particular seems to be in a class all its own -- Migraph, Inc of Federal Way, Washington. Recently I plunked down 400+ dollars of that hard-earned return and purchased their latest composium -- a software & hardware combination, The Migraph Hand Scanner and Touch-Up image processor. Briefly, Touch-Up is a GEM-based, full-featured, high resolution, virtual page, bit image creation and editing design tool (take my word for it! -- we'll decipher this later). Touch-Up has a special mode within it that allows you to interface marvelously with the Migraph Hand Scanner, allowing line-art and halftone images to be scanned directly into the program for immediate editing. I have explored nearly every nook and cranny of this dynamic duo for almost two months now and if pressed to give it just one adjective, it would be professional. But I protest; let me qualify that adjective -- allow me a modifier. The Migraph Hand Scanner/Touch-Up package is, in two words, thoroughly professional.

"IT WAS THE LITTLE THINGS THAT CHARMED ME,  
INDEED HIS CHARM SHOWED THROUGH  
IN THE LITTLE THINGS."

- my wife ..on why she married me

One of the earmarks of a professional effort, a thoroughly

professional\_ effort, is attention to detail. Fussing over the little things underlies a conscientious approach to program development and user consideration. In Migraph's undertaking I found many examples of this. You may think that they are minor but they speak to me and tell me that I'm important and not to be taken for granted. For instance, the package that it came in was very attractive and contemporary -- definitely designed to sell itself off the software dealer's shelf. My registration cards(one for Touch-Up and one for the scanner) both had the serial numbers already stamped on them(no searching through manuals and on hardware) and the cards were of the business reply, no postage necessary variety. Mailing the cards in qualifies you for a free newsletter and free technical support. The scanner hardware was meticulously packed with each component in a separate custom-fitted bubble pack, and, in what I thought was a nice little touch, they had a black protective cap covering the scanner's cartridge connector to keep it clean and to assure no damage to the pins or the connecting sheath. The manual came in a good-looking three ring binder/slip-case library shelf combination. Because of its sturdy design you can set the binder upright while learning the program to avoid goose-necking while at the keyboard.

#### Speaking of the manual...

It would be tragic to have such a powerful tool and not be able to navigate it due to hard to read, unorganized, and inaccurate documentation. But such is not the case here. Liz Mitchell ought to take up ST manual writing for a living. I know many of her ST brethren would benefit from the thorough, accurate, and easy-to-understand rendering presented in the Migraph manual. The manual is meticulous and modular, assuming little and providing quick and easy access to specific functions within \_each\_ Migraph mode -- be it drawing, clip, text, lightning, file, or scan modes. A very thorough contents section points you to each mode and the particular functions within each mode. Since some functions in different modes perform the same tasks, it would have been tempting to explain them once and then have the reader do a little cross-referencing if the function he looked up had already been explained earlier in the book. This would have been adequate but Liz and Migraph decided to make manual-flipping quick and easy by duplicating function explanations in their separate modes(call it user consideration). Generally, instructions are given in step 1, step 2, step 3 fashion with \_plenty\_ of helpful illustrations and screen shots. There are special chapters devoted to those who want to 'get up and running' with the scanner and software quickly, without first having to learn every intricacy of the program. On to the software...

#### The Touch-Up low-down....

Touch-Up (ver. 1.56) resides on my Mega 2 mono/color system with an Atari SLM804 laser printer. Touch-Up requires at least one meg of memory and a double-sided disk drive; indeed the program comes on two double-sided disks. Believe it or not T-Up will run in all three resolutions although monochrome is recommended (will also run with the Moniterm by Viking); if you must use a color monitor Migraph recommends you run under low resolution as both high and low rez use square pixels (1:1 ratio,height to width). Medium rez pixels have a 2:1 ratio and will distort your screen image. But no matter the screen rez your picture will not be limited to screen size as T-Up is a virtual-page program. You will find that in low rez your icons will not appear within their boxes and using the drop-down menus will be necessary. Almost all icon tools have a

drop-down menu alternative, so you may use the method that's easiest for you.

Touch-Up will load, edit, and save images of any size and resolution. You are limited only by computer memory and hard drive size. If you run out of computer memory Touch-Up uses an ingenious method called hard drive paging to swap portions of the image into and out of ram. If you have a Mega you shouldn't be affected too much by program swapping, but it is invaluable for 1 meg machines. T-Up will import Degas, Tiny, Tiff, IMG, GEM, PCX, Neochrome, MacPaint, and Printmaster formats while it will export high resolution images in IMG, IFF, ILBM, GIF, MacPaint, Printmaster, Degas, and PCX. As you can see T-Up can manipulate files from all major platforms and will allow you to increase the source of your ST DTP clipart.

#### Dots per inch, the real story...

One of T-Up's major strengths lies in the fact that it is presently the only ST program that can edit and manipulate IMG files. What are the advantages of IMG files? They are resolution independent and guarantee in their format the best possible resolution per output device. Image files(IMG) are also not limited to a single screen of data like Degas or Neochrome. You can, therefore, create, edit, or scan an image at the optimum resolution for your printer or project without worrying over pixel supply. For instance, ST monochrome mode is 640 \* 400 pixels. Since my output device is capable of 300 dpi (dots per inch or printer pixels per inch), you can see where, if I were creating or scanning at 300 dpi resolution, I would be limited to a printed image size of approximately 2.15 inches(640/300)wide by 1.33 inches high(400/300). The Migraph screen is only a representation of my printer page. To represent a laser printer (or any other printer, such as the Deskjet, that has 300 dpi rez) the screen needs 4 full inches for every 1 inch on the laser(300 dpi-printer/75 dpi screen). Without Touch-Up's virtual-page capabilities the largest 300 dpi image I could create on the ST mono monitor would be 2.15 inches by 1.33 inches. As you can see virtual-page representation is very valuable indeed. Without it the only way I could increase the size of my 300 dpi images beyond the aforementioned limit, would be to stretch them inside of my DTP program after import, causing major jaggie blues. So, the next time you see your friendly Migraph Touch-Up programmer, thank him for virtual-page capabilities!

#### Modes of operation....

When you first boot-up Touch-Up you will find yourself in draw mode. In draw mode you can create and edit objects at various zoom levels with the exception of full page zoom. You create your object(box, circle, arc, ellipse, bezier and b-spline curves or free-hand) first as a proto-type and then, when you are satisfied with it and have found a place on the page for it (by moving it around with the mouse) you may paste it with the press of the right mouse button. Every object has a fill pattern, line style, and shadowing(if you want just an outline drawing and nothing else you would choose a white fill, transparent writing mode, and no shadow). At anytime you may save your favorite settings by clicking on the word defaults under the tools icon. A paint can icon can also be used to fill an object or the entire page with whatever pattern was last chosen under the pattern icon.

No mirrors used here...

Clip mode is quite the magical editing tool. While in clip mode you may select any portion of your image by creating a box around it with the mouse and left-clicker. Once chosen any of the operations chosen in clip mode such as outline, clean-up, mirror, flip, rotate, slant, or bolding, act only on the chosen clip area. My favorite editing tool in clip mode is by far, flip. Many times I have found myself with a piece of clipart that(who)had the wrong orientation -- eg. I needed the man to look to the left and not to the right, I needed the horse to exit stage left but he insisted stage right. Now all I have to do is load the uncooperative piece into Touch-Up, put a box around it and say "Flip, dadgummit!". Within a few seconds, miracle of miracles, my man is looking east and not west, and my horse is running left and not right, all with no image distortion.

Text mode includes icons that allow you effortless choosing of typeface, size(in pixels not points), fill pattern, and text attributes(such as italics). Once this is done you click on the text label icon and you are presented with a dialog box to enter your text into a buffer, up to thirty five characters long. Clicking on Ok takes you out of the buffer and pressing the left mouse button while on the page presents you with a box that approximates the height and width (and descender area) of your text object(very nice!). Move your mouse around to the perfect spot on the page, click the left button again and your text object is placed on the page as a graphic object that you may do with as you please. The key to remember here is that the text cannot be edited as text(no backspacing, changing of attributes or style, etc.)once it is pasted onto the page, it is now living happily on the page as a \_graphic object\_.

File mode is the area of the program devoted to the loading, saving and printing of files. If you are loading a GEM file you will also have the option of choosing the pattern resolution(75,150,300 dpi)of any GEM system pattern that might have been used in the creation of the GEM picture. Remember too that once the GEM file, an object oriented drawing, is loaded into Touch-Up, a bit-image editor, it has left the world of vectors and entered the bit-image zone. This is why a GEM file is on Touch-Up's list of imports but is absent from the export list; after editing it must be saved in any of the bit-image formats listed.

#### Quick-print vs. Outprint

Within file mode is an icon choice, dedicated to printing your image without having to leave Touch-Up, \_if\_ you have at least two megs of memory. Mega owners with an SLM804 laser printer do not need GDOS installed to use this option, \_although\_ you will need to adjust your default maximum memory usage to the settings outlined in the manual. This is because the laser requires at least 1 MB to print (Note: Some experimentation with the values may be necessary. Although the manual stated I would have to set my memory to 512k, I actually had to drop it to 450k before my image would print.). Quick-print is a nice luxury if your memory can afford it as output is almost instantaneous. The alternative to quick-print is outprint, Migraph's GDOS IMG printing program. Touch-Up will shell out to Outprint once you have chosen it from the drop-down menus and, when you are finished with printing, you will return to Touch-Up. When I was speaking earlier in my review about attention to detail, user consideration, and thorough professionalism, I had incredible features like this Outprint shell-out, in mind. You will, of course, need

to have GDOS installed to use this option(the manual has excellent instructions on how to set up GDOS for your particular system).

Unleash your imagination with...

Lightning Mode, a fun, fully featured paint program. Lightning mode is much faster than draw mode because everything is done in buffers. As a result it offers many features not offered in other modes, making it one of the easiest and definitely most creative areas of Touch-Up. Easy in that until work is pasted on the page(either by pressing the F10 key or moving out of the present screen with the locator)you may use the UNDO key to erase the last function and shift-UNDO to erase everything done since the last time you pasted the buffer. In lightning mode every object that we explained in draw mode can become a brush complete with patterns, line styles, and shadowing, \_or\_ you can use the lasso icon to encircle any part of the image you want and use it also as a brush(I think an exclamation mark belongs here somewhere). Incredible possibilities had me experimenting for hours using different brushes and fill patterns. Also exclusively within this mode is a spray feature with options and performance unmatched in any paint program I have seen. You can actually spray a pattern in various saturations(from 12% to 100%) in perfect vertical and horizontal directions or free-hand if you choose -- again, the possibilities are endless. FatBits is an option that will magnify a tiny portion of the screen so that it fills the entire work area. The magnified area is shown in normal size in the upper left-hand corner of the screen so that you may see how your pixel editing is affecting the image.

Of Beziers and B-splines...

Bezier and B-splines are fancy names for sometimes very fancy curves. Bezier curves have a mandatory total of 4 control points while a B-spline can have from 3 to 32 control points and therefore can obviously produce more complex curves. The control that Touch-Up allows the user when manipulating these curves, is fascinating. You can instantaneously delete points, insert them, and move them around, allowing unlimited mastery over these beauties. These are available in draw and lightning modes but they truly shine in the latter mode where they become complex brushes! My jaw nearly dropped in wonderment as I discovered, for hours on end, the incredible effects of painting with these beautiful curves. A simple bezier curve became a beautiful three-dimensional vase with one circular mouse motion. Other three-dimensional shapes that I had never seen or imagined came to life before my eyes. Touch-Up is truly a master over Bezier and B-spline technology (maybe they ought to rename these curves, mi-graphs?). On that note lets move on to the...

Migraph Hand Scanner

The Migraph Hand Scanner scans line-art and halftones (photographs) at 100, 200, true 300, or 400 dots per inch (dpi). The hardware comes in 3 pieces including the scanner itself, a compact cartridge interface, and an AC power pack that connects into the cartridge. With all power off I inserted the cartridge into its port, on the side and towards the back of the Mega (never plug this in while the computer is turned on!). Next I plugged the scanner and the power pack into the cartridge; with that I was finished installing the hardware! (Note: I had a little problem getting a clean cart connection the first few times and eventually had to raise the



Mega up off the table by placing 4 bad disks under each corner; don't ask me what I was doing with 4 bad disks laying around but they came in handy).

After turning the computer on and booting Touch-Up, I entered the scan mode by clicking on an icon of the scanner. According to the manual I set my software and hardware at the same resolution and then chose full width at 4 inches height for my scanning area. Since I was scanning some black and white ink drawings out of a book I set my document setting on the side of the scanner to Letter(this is the setting to use for line-art, there are also three dither settings for halftones represented by small, medium and large dots). All set to go, I then clicked on the icon for scanning to full-page(as opposed to scanning into a clip area). Touch-Up then warned me of overwriting the existing image to which I hit the return key. Looking over the top of the scanner I noticed a long, thin, green light appear in the scanner window. I aligned the light over the image, pressed and held in the start button on the side of the scanner and proceeded to slowly move the scanner, without any guides, down the length of the drawing. A small round green dot just below the scanner window remained solid throughout the scan indicating to me that I was not going too fast (it flickers if you are scanning too fast for it to gather the 100-400 dots per inch needed as dictated by the scanner and software settings). When I had scanned down 4 inches(as set in the software) the scanning light went off and within 2 seconds, the image in my book appeared magically on my monitor. The first time you do this you are awe-struck to say the least. "This is neat!", I exclaimed and immediately I showed it to my wife, my 8 year old girl, my 2 year old toddler, my 2 month old baby boy, and my three gold fish.

In the last month or so, I have become quite the scanning fool and have made the following observations. Before I got the product I thought that scanning would be a fun but touch-and-go proposition, subject to an exacting and rigid discipline. I couldn't have been further from the truth. I have found it very easy to keep the scanner in a straight line and have had the little round light flicker at me only once. Most of the time I keep the contrast dial on the scanner set in the middle and my scanned images have been echoed to my monitor with incredible clarity. I rarely have to use the clean up tools available within the clip mode due to very clean and crisp scans. I have seen scanners on MS-DOS computers but their output doesn't come close to matching the Migraph Hand Scanner.

#### Some scanner facts...

The Migraph Hand Scanner has a large 4 1/8 inch scanning window. Depending on computer memory, image resolution and scanning width you can scan an image from 2 to 14 inches in height. The scanner has three dither settings. Normally the small dots setting provides the best output for halftones but experimentation with dpi, contrast, and dither settings is easily afforded by the scanner's speedy operation. The scanner turns off automatically when not in use so as to avoid damage.

#### True 300 and 400 dpi settings?

Logically you may reason that Migraph is saying that most, if not all, hand scanners only simulate 300 and 400 dpi scanning and this is exactly the case. Other scanners have only one bank of sensors that receive only 200 dots of data per inch. They use a mirroring type algorithm in their software to simulate 300 and 400 dpi. The Migraph Hand Scanner on the

other hand has two banks of these sensors and can therefore receive up to 400 actual dots of data per inch! How do they do it? Well certainly not with mirrors.

To try and help you get a practical grasp on the peculiarities of different resolutions(dpi) as they relate specifically to the scanned output of the Migraph Hand Scanner, I have prepared a comparison table. I ran a test that consisted of scanning the same image(the witch line-art sample in the Touch\_Up manual) at all 4 resolution settings on the scanner(100,200,300, and 400 dpi). For each scan my scanning area was full width at 4 inches of height. After each scan I saved the picture in IMG format under a different file name and before I moved on to the next scan I printed it out on the Atari laser through the quick-print option. I then measured each scan by file size, printed width and printed height.

DPI	IMG File Size(bytes)	Printed Height(inches)	Printed Width(inches)
100	6201	14/16	15/16
200	17997	1 & 11/16	1 & 13/16
300	32653	2 & 9/16	2 & 11/16
400	49613	3 & 7/16	3 & 8/16

Generally speaking, there were no jaggies in any of the pictures. With greater dpi came greater detail in a larger printed picture. At each level the area of the picture increased fourfold. For instance the 200 dpi picture was 4 times the size of the 100 dpi picture (and in greater detail); the 300 dpi picture was 4 times larger than the 200 dpi picture and the 400 dpi was 4 times larger than the 300 dpi picture. Taking this further, the 300 dpi inch picture wound up being 12 times the size of the 100 dpi picture. Hmm ..Get the picture?

In conclusion...

Touch-Up seems to be quite at peace with itself and the scanner. Not \_once\_ did the program bomb itself out while interfacing with the scanner, entering and exiting the various modes, shelling back and forth to Outprint, or while arguing with me about my maximum memory allocation. Remember how I had to experiment with defaults before I could get quick print to work? I've seen this type of interaction eat many a program's lunch!).

Touch-Up also gets an award for being quite the GEM thoroughbred; when they say GEM-based they mean it. Never before have I seen an ST program take advantage of GEM like Touch-Up does -- here we have a program that has rediscovered the right clicker for the benefit of a very powerful and slick user-interface. Because of the program's sophistication they could have easily copped out on GEM and stuck us with an interface riddled with control, shift, and alternate, key-combo's. Instead they stuck with the intuitiveness of GEM, benefiting both the beginning \_and\_ experienced user. Thank you Migraph!

Finally...

The Migraph Hand Scanner and Touch-Up package is a must for any small or large business involved with desktop publishing. Once you start availing yourself to Touch-Up's incredible editing, design and creation tools for high-resolution images you will conscientiously make it a part of a large percentage of your projects. Time is money and the time and effort that Touch-up will save you will enable you to be a more productive DTP'er. And if you are a professional DTP'er you already know that you have to have a scanner; I won't belabor the point but I will say that the 300+ net cost of the scanner now puts scanning convenience within everyone's reach without compromising output quality. And for these same reasons I would highly recommend this package to the serious home user(besides its a whole heck of a lot of fun!).

Believe it or not I feel as though I just scratched the surface of this incredible offering from Migraph. I would need about 5 more sessions to do the product justice and indeed I may come back to it in the future. In the mean time why don't you save me the breath and experience it yourself!

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(206)838-4677 - (800)223-3729

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> Kidpublisher Pro STR Reviewâ € Desk Top Publishing for all ages!  
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DTP for the Small Fry!!  
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by R. E. Rosendale

The latest kidprg (tm) by D. A. Brumleve is Kidpublisher Professional a desktop publishing program for young writers, recommended for children ages 5-11. The version number is 6.0 because there are earlier "careware" versions of Kidpublisher.

What makes this version different from the earlier versions other than the word Professional being added is that it is an expanded, improved, and completely rewritten version. a faster word processor with word wrap and

an underline function has been added. There are now four font sets. When you select the font icon you will go to a font screen, click with the mouse on the portion of the screen to see the different styles. When you have decided which font it will automatically load (only one is usable at a time - no mixed fonts).

If there is any text already typed it will automatically change to the new font, it is recommended you select your desired font first so that there will not be any overflow of text at the bottom of the screen, i.e. starting with a small font and then changing to the large font will reduce the number of words allowed per line or page. The drawing program has been expanded so that besides Line, Box, Circle and Fill there is now an Undo feature.

The manual is written with the parent or teacher in mind and there is a pull-out instruction sheet for the child to use, one side for the text editor and the other side for the drawing program. One of the nicest features is the addition of a title page so that if the child is making a booklet, they may title it, give the author credit and give the illustrator credit.

Other than the title page, each page is divided into two parts. The top half for the drawing and the bottom for the text. The ruled typing area provides seven lines of thirty-three columns each. If a word is typed at the end of a line and the word is too long it will word wrap that word down to the next line. The red cursor can be controlled by either the arrow keys or the mouse. The F1 - F10 function keys, Esc, Tab, Control, Alternate, Help, Insert, and Clr/Home keys do not operate.

The drawing screen becomes active when Draw is selected on the typing screen, to return to the typing screen select the Type icon. Of course the only colors available are Black on a White background, but here is a hint, if you select the solid black Fill pattern you can select the Erase icon and "draw" in white. For creativity, the child may want to hand color their pictures after they are printed. The same is true if the outline font is selected.

The Blank option in either the typing or drawing mode will present the user with an alert box, asking to erase the whole screen.

Selecting the Page icon in either mode will move you to the next page in the same mode. There are five text pages and five drawing pages. If you are on page five and select page again, you will be returned to the first page. This comes in handy to flip through the pages to remind you what you have previously done. All five pages remain in memory until saved.

When typing and drawings are complete it is time to either save or print the pages created, or both. If saved, the same story and pictures will be loaded. If your child wants to keep their collection of story/art masterpieces they will need multiple copies of the disk in order that each story will autoloading when the disk is booted. This was done so that the child would not have to swap disks. As an adult, I would have preferred a load feature so that each story could be loaded from a folder named for the story. The Kidpublisher Professional package does contain extra labels.

Kidpublisher Professional comes with a unique copying policy. If you, as a parent, have several children in your household, may furnish each child a copy of the original disk. If you are a school teacher and your

students use Atari ST's at school. You may furnish a copy for each one of the students. If however, little Johnny next door wants a copy, ask his parents get a copy of one of the earlier careware versions or buy a copy for their household.

Kidpublisher Professional sells for \$25 from:

D. A. Brumleve  
P. O. Box 4195  
Urbana, IL 61801-8820.

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> SYQUEST NEWS STR Spotlightâ € The LATEST info....  
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ON THE CUTTING EDGE  
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The first 5 1/4 inch Winchester disk drive with its disks, read/write heads and positioning motors sealed in a self-contained, low-profile removable data module is announced by Syquest Technology Inc. of Fremont California.

The unit is called the SQ5200, the 175 mb (formatted) SyQuest drive offers the convenience and flexibility of a removable cartridge Winchester disk drive and the versatility, performance and storage capacities associated with conventional, high performance, fixed disk drives. It is designed specifically for work station applications requiring unlimited storage capacities and single workstations supporting multiple, high capacity users with private or dedicated data bases. It is also aimed at applications where data security is a critical element in systems design, for high speed file back up and for data interchange.

The SQ5200 incorporates fully embedded SCSI controllers for ease of integration into a wide range of workstations and small business desktop computer systems. Its design harkens back to the first Winchester disk drive, the 14 inch IBM 3340 introduced in 1972, according to SyQuest vice president of sales and marketing Arnold Cooley. "Until that time disk drives incorporated removable disk packs," he said, "but the demands for more capacity led to the development of a new type of drive, the fixed disk Winchester."

The desire for data storage devices that made provision for removing the disk, storing it or interchanging it with other drives remained strong among many users, however. As a result, the IBM 3340 was designed so that the sealed head/disk assembly containing read/write heads, disks and actuators could be removed as a single unit and interchanged with other

drives.

This feature disappeared as the reliability of fixed disk drives increased. "Nonetheless, there has always been a large body of applications in which removability is a key consideration," Cooley said. "Many of these applications can be satisfied by the removable, fixed disk Winchester cartridge drives now on the market." Use of the module concept also permits the use of multiple disks in a removable product for even more storage capacity, he added.

The SyQuest 5200 series data module drives incorporate a rotary voice coil actuator to handle head positioning, and operate at average seek times of 19 milliseconds. They can handle asynchronous transfer rates as high as 1.25 mb per second. Synchronous transfer rates between drive and system can reach 5 mb per second. The data module itself slips in and out of the drive chassis and is hooked to the printed circuit board via an electrical connector at the rear of the module.

Other key specifications of the SQ5200 include:

Track density	1407 tpi
Tracks per surface	1747
Recording density	25,065 bpi
Flux density	16,710 fci
Recording method	2,7 RLL
MTBF	60,000 hours
Start/stop cycles	20,000 minimum
Dimensions	1 x 5.25 x 8
Power (Idle)	9 watts

The SQ5200 is priced at \$690.00 including data module, in OEM quantities. Evaluation versions will be available at the end of this year; production versions will be available in the first quarter of 1990.

SyQuest Technology Inc. was founded in 1982 and has shipped over 300,000 drives and 1 million cartridges. The company maintains a 76,000 sq ft. manufacturing and administrative facility in Fremont California, and an 8500 sq ft facility in Singapore. A 40,000 sq ft. manufacturing facility in Singapore will be brought online in January 1990. The company is privately held.

Editor Note:

Both the 5.25 inch 175mb unit and the new 3.5 inch 42mb units were operating and on display at Comdex/Fall '89 show in Las Vegas.

The SyQuest 3.5 inch unit called the SQ355 is 42mb (formatted) and provides the same basic benefits at all the fine units in the SyQuest family of fine products. The SQ 355 is expected to boost versatility in most all the laptops available.

The SQ 355 operates at an average seek time of 19 milliseconds and is equipped with either a 16 bit AT interface or an embedded SCSI controller.

Key specifications include:

Track density	1407 tpi
Tracks per surface	1257
Recording density	23,736 bpi
Flux density	15,824 fci

Recording method	2,7 RLL
Data Xfer Rate SCSI Asyn	1.25 mb sec
Data Xfer Rate SCSI Sync	4.0 mb sec
Data Xfer Rate AT	2.5 mb sec
Data Xfer Rate Buffer xfer	4.0 mb sec
MTBF	50,000 hours
Start/stop cycles	10,000 minimum
Dimensions	1 x 4 x 5.75

The SQ 355 is priced at 290.00 including cartridge in OEM quantities. Evaluation versions of this unit will be available during the first quarter of 1990.

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> BRANCH SOFTWARE STR Spotlightâ € A bright, NEW company supports Atari!  
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Branch Always Software is ready for business!  
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December 1, 1989

Branch Always Software is proud to announce its entry into the Atari ST retail software market. Branch Always Software was founded by two programmers you already know well, Ignac A. Kolenko and Darek Mihocka, authors of several popular public domain and shareware programs.

The goal of our company is to provide all ST users with low cost quality software that runs on all Atari ST systems, whether for 512K machines or 4 meg machines. We write software for the exact same reason you bought an Atari ST in the first place: to provide power without a large price.

Up until now, our software was available only as shareware. But we understand that not all users have access to bulletin boards and that some users want the convenience of being able to buy software through a dealer.

Our first product, Quick ST, is now shipping to Atari dealers throughout the United States and Canada, which includes 3 programs for a price of only \$19.95 US.

The package contains Quick ST version 1.7, Quick Index, and Quick View, as well as some of our previously released public domain software.

Quick ST increases the speed at which the ST performs screen operations, such as printing text to the screen, scrolling the screen,

drawing windows and dialog boxes, and reducing the overhead of other graphics operations.

The result is that your Atari ST appears to run faster and smoother. Quick ST runs from the AUTO folder and so does not use any desk accessory slots or require interaction with the user. It is completely transparent to other applications, and uses only 10K to 20K of memory.

Quick Index is the de facto benchmarking software for the Atari ST/STE/TT line of computers. Its 11 different tests show the relative speed of your system in such categories as CPU speed, disk drive speed, and TOS efficiency. It is already widely used to test various hardware upgrades, such as accelerator boards, memory caches, and hard disks.

Quick View is a very useful text file reader. It quickly displays text files, forwards and backwards, and is very handy for reading large README files, online magazines, and even source code. It can run from the desktop, from a command line shell, or as an installed application. Simply double click on a text file and Quick View automatically loads.

If your dealer does not yet carry Quick ST, ask him to order it from distributors such as Horizon Computers or Pacific Software Supply. In Canada, or overseas, they can order directly from Branch Always Software. We also offer discounts to user groups. Write or call for details.

We at Branch Always Software know that the best ways to attract users to our products are to keep prices low and have our products available when advertized. This means that we won't waste our money on fancy packaging or big glossy magazine ads. But it does mean that you can go to your dealer and buy Quick ST now, not next quarter or next summer.

We will not make any vaporware announcements, so when we are actually shipping our next product, we will announce it, and product demos will also be uploaded to Compuserve and GENie.

In the meantime, we'd like to wish everyone a safe and happy holiday season, and we hope to see everybody back in 1990.

If you are a software developer and would like to market your software through us, give us a call. We are looking for other quality low cost software to bring to Atari users.

Branch Always Software  
PO Box 2624, Station B  
Kitchener, Ontario N2H 6N2  
Canada

phone: (519)-570-4340  
FAX: available in January

Compuserve: 73657,2714  
GENie: DAREKM  
Usenet: uunet!watcgl!electro!brasoft!ignac  
or uunet!watcgl!electro!brasoft!darek

Quick ST 1.7: \$19.95



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> SEAGATE! STR Spotlightâ ¢           The origin of ST506/412 standard.  
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A GROWTH INDUSTRY SHINES!  
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by R.F. Mariano

It seems like only yesterday that Seagate set out to create the first 5.25 hard disc drive for PCs. Its amazing to see that a decade has gone by since they opened up shop in Scots Valley, California.

The advent of the personal computer in the '70s the most powerful initiative. This new, powerhouse of a desktop machine provided users with unheard of capabilities and opportunities. Seagate seemed to recognize an opportunity of their own; "A chance to apply their expertise in floppies and large hard disc drives to small hard disc drives for these very popular and capable computers.

The first generation of personal computers used floppy disks or tape drives for loading and storage of data and programs. While adequate, the capacity and severe speed limitations left users wanting more.. much more. And so, in steps Seagate, they decided to apply the storage principles of the 8" Winchester drive, but shrink the size and price. Thus, providing the users with a high speed, high capacity and less expensive storage solution.

In mid 1980, Seagate unveiled the ST506, the world's first full height 5.25 inch hard disc drive for personal computers. (notice ST506? An industry standard) .. With a huge 5 mb of formatted capacity and a rather hefty price tag, compared to today's standards, of \$1500.00, this was the greatest thing to hit the computer industry since software itself. This first model hit a blistering seek rate of 85 msec and carried a meager 11,000 hours MTBF rate. Hard discs have certainly come a long, long way.

As the userbase began to snap up these jewels of storage, the volume caused the prices to become more reasonable, \$900.00 or approximately \$180.00 per megabyte. The demand for this device was nothing short of phenomenal and as a result, the Seagate name and industry standard was firmly established. Thus, the ST506/ designation. The users were quick to appreciate the benefits of a hard disc drive in their personal systems. However, they soon realized the need for more storage. Therefore in no time at all, Seagate increased the areal density and in 1982 they introduced the ST412. [ST506/412 - look familiar?] The basic interface of these models have remained fully an industry standard.

A major factor that has seen monumental change is the cost to produce a hard disc drive. As the technologies and manufacturing processes have advanced, and as market consumption has steadily increased, prices have dropped dramatically. In response to the demand for higher quality and lower prices, Seagate, almost six years ago, decided to divide their operations three ways, the United States, Singapore and Bangkok. This maneuver enhanced the production costs appreciably.

Another major player in the forming of today's market was the vast change to shape of the distribution channels. No longer would there be only OEM sales. Now dealers were stocking the devices and installing them. This type of dealer and value adders were a whole new ballgame for Seagate, who responded by creating a distribution network that was designed to compliment existing OEM agreements.

Seagate soon learned that servicing a multitude of dealers was quite different from a handful of OEMs and was faced with developing a full scale service, training and support program to maximize customer satisfaction worldwide.

The eighties gave the users an opportunity to observe the hard disc industry in a relatively short ten year period that experienced a shakeout the likes of which had never been seen. This is evidenced by the fact that very few, if any, of Seagate's original competitors are still around. Not only did Seagate survive the tumult, they have established products, technologies and development resources that are designed to keep Seagate at the forefront of the mass storage, disc industry for the next decade and more.

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> ST REPORT CONFIDENTIALâ € Sayin' it like it is....  
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- British Columbia, CAN.       \*\*\*\*\* GRAVIS TO FIX MEGA TIMING BUG!       \*\*\*\*\*  
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Gravis is very much aware of the MEGA BOOTUP PROBLEMS and have stated they have SOLID PLANS TO FIX THE PROBLEM. However, they did say that those users who own the new joystick and have not registered it must do so as soon as possible, if they expect to have the problem remedied. In the meantime, to avoid the timing problem plug the joystick AFTER booting your Mega, they said. While reflecting on the Gravis joystick, Falcon flies great - set auto centering on the stick, mouse 2 option in the control menu, push the forward button once to center - the stick centers on its own from here on. Give the stick a try on Shufflepuck Cafe - leave it in auto centering and set the handle tension to 0. This takes a little getting used to, but it works great. In addition, the reception of the Gravis joystick in Europe has been first rate all the way. Looks like

they know a good thing when they see one. If you have any questions, call: 604-434-7274, we did and we must say "they are extremely helpful folks". Besides, who said it was a bug? ...Its an undocumented feature! It checks timing.

- Rockville, MD

\*\*\*\*\* GENIE OPENS PORTFOLIO FILE LIBRARY \*\*\*\*\*

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In keeping with the full support premise, GENIE and its Atari Roundtables have opened a dedicated Portfolio files library. This move compliments the already functioning Category 35 area focusing on messages posted pertaining to the Portfolio to and from users and Atari support personnel.

- Chicago, IL.

\*\*\*\*\* SEARS SEZ LYNX BACKORDERED 'TILL 12/24! \*\*\*\*\*  
CHRISTMAS EVE???

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"T'was the night before Christmas and all through the house...." The old familiar expression may have a very empty ring to it this year if Santa can't deliver.. Indeed an upcoming generation will have a hard time forgetting the BIG LETDOWN if there are no Lynx game machines under the tree. Knowing this, its easy to understand why all of Santa's helpers are frantically getting the job done to make sure there are NO tears in \* any \* youngster's eyes.. but backordered right to Christmas Eve? Atari sez 12/21, in any case, its ...Kinda tight but do-able ...

- Washington, DC

\*\*\*\*\* AMIGA COMPUTERS FOR UNCLE SAM \*\*\*\*\*

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Commodore has announced their negotiations with Uncle Sam were successful and they have been awarded a government contract. The Pentagon will be able to procure Amiga Computers for all branches of the military, they said. It is also reported that NASA is part of the contract and will also require a number of Amiga computers.

- Jacksonville, FL.

\*\*\*\*\* PC DITTO IS ALIVE AND WELL! \*\*\*\*\*

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Bill Teal of Avant Garde paid a visit to Peripheral Vision in Jacksonville today and demonstrated PC - DITTO II. According to the folks who attended, the device is as solid as a rock and performed flawlessly. Also noted was the fact that those folks who have received the second postcard acknowledging the prepaid order will be receiving their Ditto II very shortly. Avant Garde has already shipped "review" units to the magazines. So... rest easy folks, Bill Teal has come through.

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